THE SCIENCE OF SURVIVAL

ACR ELECTRONICS

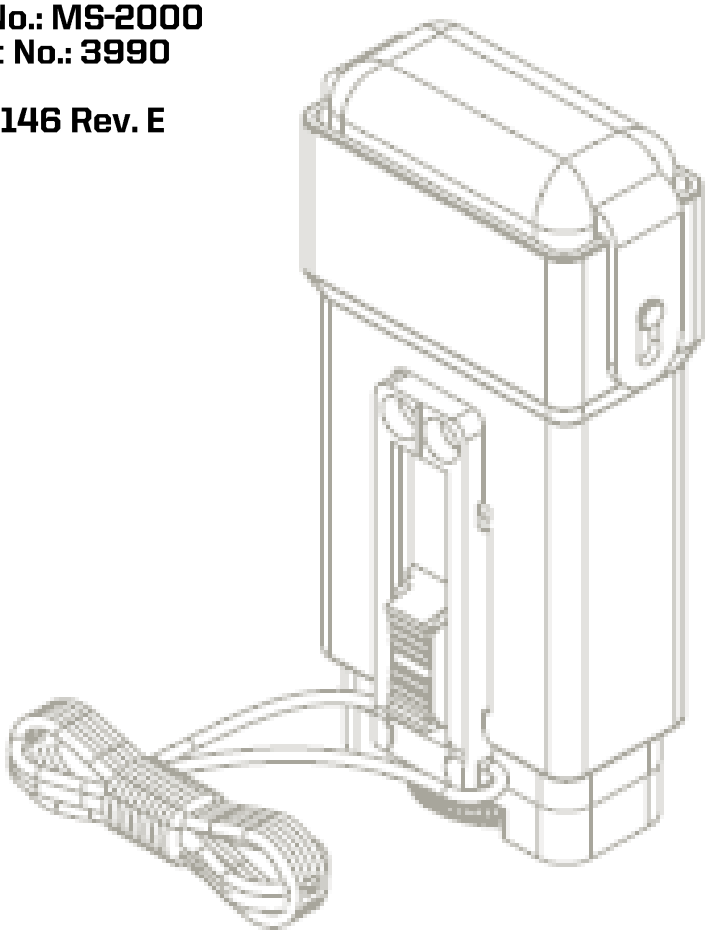
COBHAM

PRODUCT SUPPORT MANUAL

MS-2000 (M)// Distress Marker Light

Model No.: MS-2000
Product No.: 3990

Y1-03-0146 Rev. E



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CAUTION: Before proceeding to install, test or use your new ACR Electronics' product, please read this Product Support Manual in its entirety.

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Table of Contents

SECTION ONE- GENERAL _____ 3
SECTION TWO- OPERATING INSTRUCTIONS _____ 5
SECTION THREE- TESTING AND MAINTENANCE _____ 7
APPENDIX A – WARRANTY, USEFUL LIFE POLICY, NOTICES 11

PLEASE READ ALL WARNINGS, CAUTIONS AND NOTES CAREFULLY

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SECTION ONE- GENERAL

This publication provides maintenance and operating instructions for the MS-2000(M) Distress Marker Light.

1. Purpose

The light is designed and intended to provide aircrew and other personnel with a high-intensity visual distress marker signal for use in the event of unscheduled abandonment of aircraft in isolated regions and other emergency and/or special operational mission situations.

2. General Characteristics

. The MS-2000(M) Distress Marker Light is a lightweight, compact, battery operated, portable unit that is designed to be used as a multi-functional light during emergency and/or clandestine special mission situations. The light is designed to attract attention, to assist in location and to facilitate personnel rescue operations in both overt and covert operations.

. The light system consists of a main body case containing the electronics, lamp, batteries and the flashguard (FG) shield containing one infrared (IR) and one blue filter. The flashguard also has raised battery polarity indicators to assist in non-visual battery replacement. The case is fabricated of high impact, cut resistant thermoplastic material and designed to insure watertight integrity of the main body case. The light utilizes a xenon strobe lamp, is powered by two AA batteries and is actuated by a magnetic reed switch. The light is designed for one-handed operation and may be operated by either hand or attached to any object.

. The flashguard shield contains both an IR and blue filter which are used as safeguards in hostile territories so as to prevent possible signaling confusion (i.e., small arms ground fire) between the signaler and observer. The IR filter provides omni-directional transmission of IR wavelengths. The blue filter is used for line-of-sight (directional) light transmissions. The IR filter is designed for use during clandestine operations.

. Electrical power for the MS-2000(M) is provided by two 1.5V, AA, alkaline batteries located in the base of the main body case. A retained battery door is provided with an "O" ring seal to insure its watertight integrity. Additionally, electrical power is controlled by a magnetic reed switch located on the side of the main body case. This switch also insures waterproof integrity of the main body case.

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3. Theory of Operation

All electrical circuitry comprising the MS-2000(M) strobe light is enclosed within its main body case assembly. These circuits operate to step up the battery voltage to a level sufficient to fire the xenon flash tube. This stepped-up voltage is so timed that the flash tube will fire between 40-60 flashes per minute.

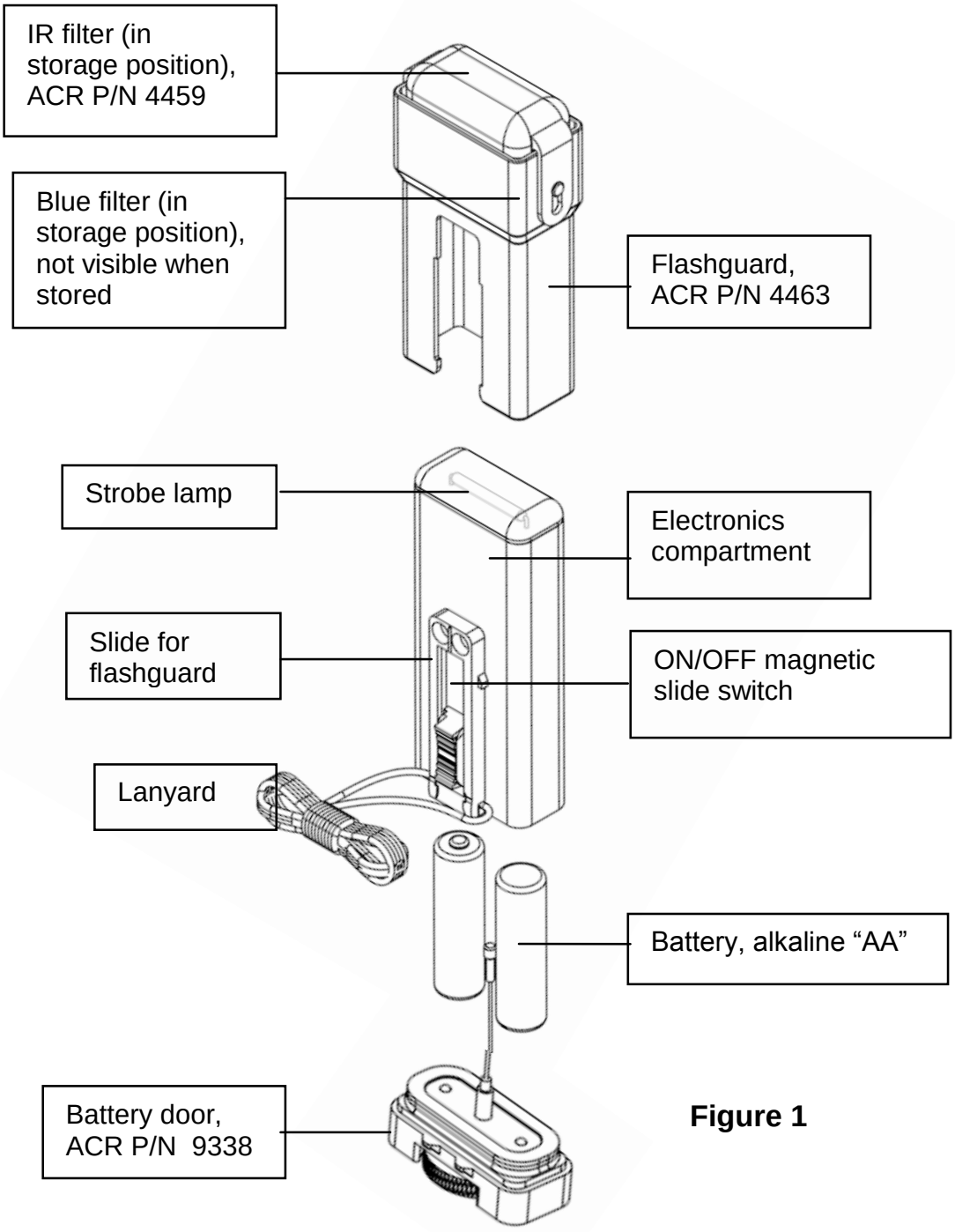
IR filter (in storage position), ACR P/N 4459
Blue filter (in storage position), not visible when stored
Flashguard, ACR P/N 4463
Strobe lamp
Electronics compartment
Slide for flashguard
ON/OFF magnetic slide switch
Lanyard
Battery, alkaline “AA”
Battery door, ACR P/N 9338

Figure 1

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SECTION TWO- OPERATING INSTRUCTIONS

a. Turn "ON"
Slide switch up until it stops. The strobe should begin flashing within a few seconds.

b. Turn "OFF"
Slide switch down until it stops. The unit will stop operating.

c. White Light
With the flashguard shield in the retracted (stored) position, slightly raise the IR filter and rotate it either left/right 90°, push filter in to lock into place. (See Figure 2)

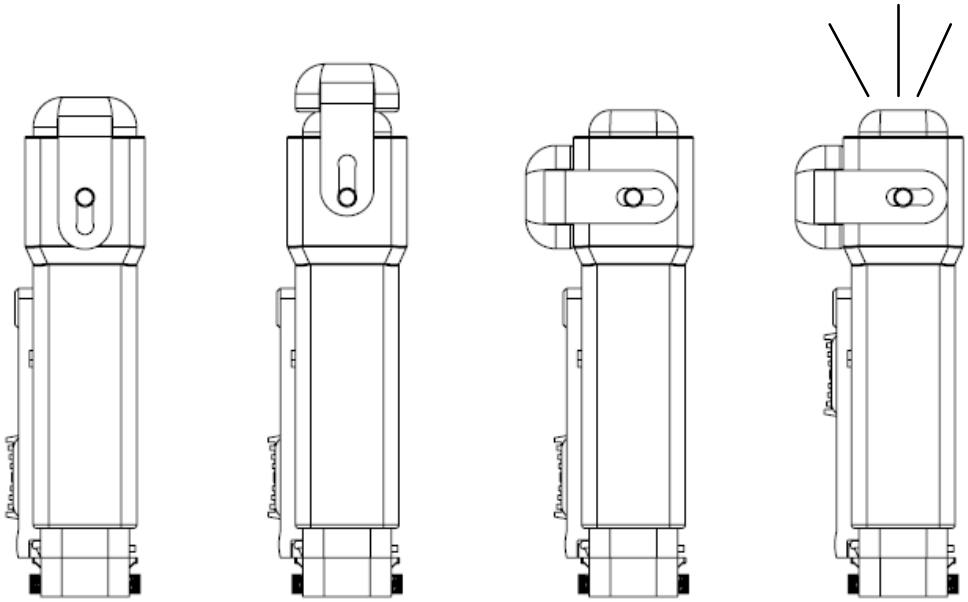

Figure 2

d. IR Light
With the flashguard shield in the retracted (stored) position, insure that the IR filter is resting on the top (vertical) end of the light over the clear lens, then push filter down to lock into place. (See Figure 3)

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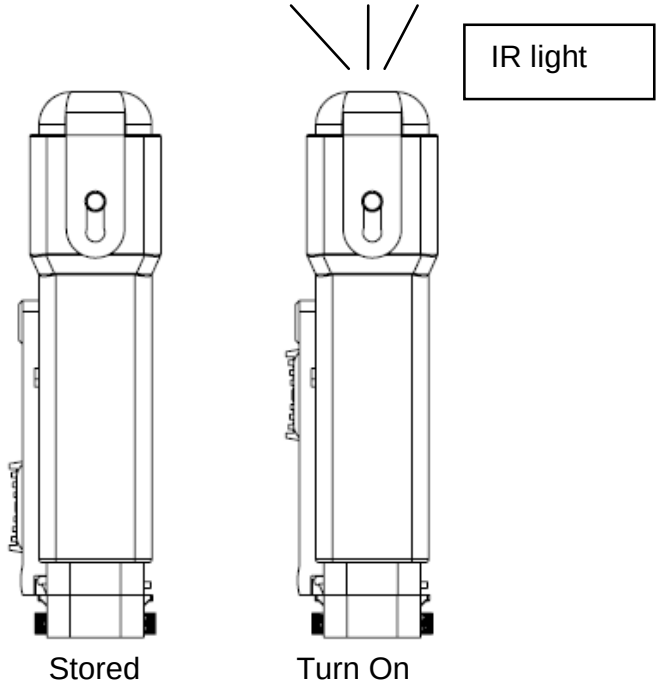

Figure 3

e. Blue Light

With the flashguard shield in the retracted (stored) position, slightly raise the IR filter and rotate it either left/right 90°. Then snap it in toward the side of the light to lock it into position. While holding the main body case with either hand, grasp the flashguard shield with the other hand and pull it up until it stops or a slight locking sound is detected, then release. This is an indication that the blue filter has been released and fully engaged to its proper operating position. (See Figure 4)

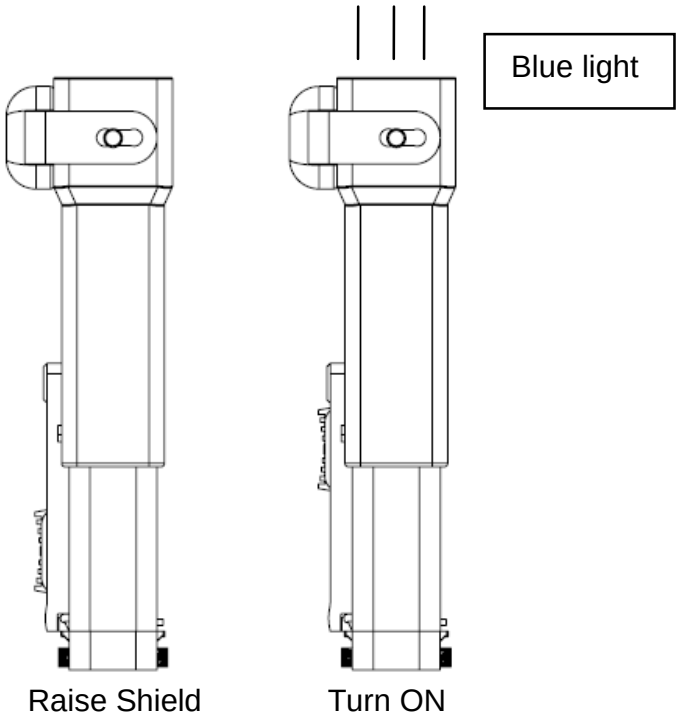

Figure 4

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SECTION THREE- TESTING AND MAINTENANCE

1. Light Leakage Test

With the IR filter in its operation position (See Figure 3), turn the switch ON and observe that no light is transmitted through the sides of the case or the flashguard shield. Turn switch OFF. No light leakage is allowed in the IR mode. If necessary, replace the flashguard shield assembly and repeat the test. If a new flashguard shield fails to remedy the problem, the light is to be condemned and discarded in accordance with local procedures.

2. Flash Rate Test

a. Initial

A ten minute MANUAL flash rate test is a one-time requirement for all new MS-2000(M) lights received from supply stock. This test is required for initial acceptance of the light and is conducted to insure that the light is capable of sustained operations.

Select the white light function (See Figure 2), turn the switch to ON and observe that the strobe lamp flashes. Allow the light to flash for nine (9) minutes, and then manually count the flash rate of the strobe during the final one minute of the test. This rate should be 50 ± 10 flashes. It is not necessary to directly observe the light flashes during this evaluation. This inspection should be performed in a dark room or enclosure.

If any light fails to meet the 50 ± 10 flash rate requirements, check the batteries and, if necessary, replace both batteries and repeat the test. Additionally, the battery contacts in the battery well should be checked and, if necessary, cleaned with a small brush. Hold vertical while using brush so that any debris falls out of the light. Repeat the test again. If battery replacements or cleaning contacts fail to correct the problem, discard the light in accordance with local procedures.

b. Periodic

Normally this test is accomplished in conjunction with other life support survival kit/vest test requirements and/or as required by specific MAJCOM directives. This test may be accomplished MANUALLY or AUTOMATICALLY by using the TS-23/A Strobe Light Tester.

If the test is to be conducted MANUALLY, follow the test procedures as outlined in paragraph 2a above, except limit the test duration to two (2) minutes. Again, a flash rate of 50 ± 10 flashes per minute is the acceptable test rate.

If using the TS23/A Strobe Light Tester for this inspection, the light can be tested in the TS-23/A with the IR filter in place, by placing the lens/filter over the inspection window on the TS-23 face label and then

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pressing the trap door down to turn the TS-23 "ON", or by removing the flashguard shield and inserting it into the tester. This is accomplished by separating the main body of the light from its flashguard shield. This separation is performed by holding the main body of the light with one hand while grasping the flashguard shield with the other and pulling in opposite directions.

After separation, insert the top of the light into the trap door on the top of the TS-23/A, insuring that the xenon lamp is fully inserted into the tester. Turn the light switch ON and note the numerical reading recorded on the digital readout of the tester.

An acceptable reading between 100-150 is required and equates to a flash rate of 50 ± 10 flashes per minute. If a reading of less than 100 is noted, replace both batteries and, if necessary, clean the battery contacts in the light, then repeat the test. Should any light continue to fail this test, discard the light in accordance with local procedures.

Upon completion of this test, the reassemble the light by inserting the top of the light (lamp) into the bottom of the flashguard and pushing upward until it stops.

NOTE: Standard ambient temperature for performing flash rate test is 70° Fahrenheit. A lower temperature may result in somewhat lower flash rates.

c. BA-3058/U battery ("AA" Alkaline) or equivalent

Currently only a commercial test fixture exists to test the BA-3058 Radio Shack part number 910-2135 Type 22-096 or equivalent. Therefore, batteries surpassing their lifecycle/manufacturing duration's or batteries that are found to be defective will be discarded in accordance with local disposition instructions/guidelines.

2. Test Equipment and Tools

No special test equipment other than the TS-23/A Strobe Light Tester is required to test the MS-2000(M) strobe light. If this tester is not available or functionally inoperative, flash rate testing can be accomplished MANUALLY in accordance with procedures outlined in paragraph 2a except limit the test to two (2) minutes, counting the rate in the last minute. Test equipment for the BA-3058/U battery is commercially available.

3. Maintenance Requirements

Since all electronic circuitry of the MS-2000(M) strobe is enclosed within its main body case assembly and cannot be disassembled without destroying its integrity, preventive maintenance requirements are limited to initial and periodic flash rate testing and visual inspections.

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Battery preventive maintenance visual checks will be performed during initial and periodic inspections of the light.

4. Preventive Maintenance Checks

WARNING: Do not perform preventive maintenance in a flammable atmosphere or near an open flame.

a. MS-2000(M) Distress Marker Light

(1) Check that the xenon flash tube lens is not cracked or discolored.
(2) Check both the main body and flashguard shield cases for cracks or excessive abrasions.
(3) Check for full and free operations of both the IR and Blue light filters.
(4) Check that the IR and Blue filters are not cracked and discolored.
(5) Check that the light switch moves up and down freely.
(6) Check that the battery wells are free of dust and are clean.

b. BA-3058/U Battery (or equivalent) 1.5V, AA, Alkaline.

(1) Check the battery case for cracks, swelling or leakage. Replace as necessary.

(2) **CAUTION:** Do not mix different battery brands.

(3) **CAUTION:** Do not mix old and new batteries.

(4) **CAUTION:** Do not mix different battery types, e.g., lithium and alkaine.

(5) Replace batteries if device is used on a mission or annually.

5. Alignment

No alignment procedures or special inspection requirements must be performed on the MS-2000(M).

6. Periodic Inspection Requirements

Normally the MS-2000(M) and associated batteries will be inspected concurrently with other equipment installed in aircraft/ejection seat survival kits, aircrew survival vest or other special requirements. Such inspection intervals will be as specified by respective MAJCOM/agency life support directives. Periodic inspections will include both flash rate and preventative maintenance checks. See previous sections for details. Record inspection dates per MAJCOM/agency procedures and directives.

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7. Replacement Parts List (See Figure 1 for additional details)

a. Flashguard shield assembly, ACR P/N 4463

b. Battery door assembly, ACR P/N 9338

c. IR Filter, ACR P/N 4459

Item a. comes complete with blue filter, IR filter and labels.
Item b. comes complete with retention cable, battery cover screw, door and o-ring.

8. Parts Replacement Procedures

a. To replace flashguard

Remove the old flashguard by grasping the flashguard with one hand and the light body and lanyard in the other. Pull them sharply away from each other. Then slide the new flashguard in place until it clicks into the locked position.

b. To replace the battery door

Unscrew the wire cable from the insert in the battery compartment. To install new battery door, screw the cable end through the insert in the battery compartment. The cable is held in place after the threaded cable-end goes all the way through the insert.

c. To replace the IR filter

Remove the old filter by locking it in the IR position, then slide a 7 level screwdriver between the flashguard case and the IR filter attachment leg twist the screwdriver or pry upward and the leg will pop off of the retainer. Put the replacement filter into place then press with thumb to seat legs over retainers.

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APPENDIX A – WARRANTY, USEFUL LIFE POLICY, NOTICES

LIMITED WARRANTY

This product is warranted against factory defects in material and workmanship for a period of 1 (one) year* from date of purchase or receipt as a gift. During the warranty period ACR Electronics, Inc. will repair or, at its option, replace the unit at no cost to you for labor, materials and return transportation from ACR. For further assistance, please contact our Technical Service Department at ACR Electronics, Inc.,5757 Ravenswood Road, Fort Lauderdale, FL 33312-6645. Email: service@acrelectronics.com, Fax: +1 (954) 983-5087, Telephone: +1 (954) 981-3333.

This warranty does not apply if the product has been damaged by accident or misuse, or as a result of service or modification performed by an unauthorized factory. Except as otherwise expressly stated in the previous paragraph, THE COMPANY MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, AS TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER MATTER WITH RESPECT TO THIS PRODUCT. The Company shall not be liable for consequential or special damages.

To place the warranty in effect, register online at www.acrelectronics.com or return the attached card within 10 days.

*Five years for the following products: EPIRB, PLB, S-VDR, SSAS.

USEFUL LIFE POLICY

The typical service life of a properly maintained Product is limited to 12 years from date of manufacture. Products that are 12 years and 1 month or older from date of manufacture will not be serviced by ACR or our Battery Replacement Centers. A Product that is 12 or less years old from date of manufacture will be serviced as long as the unit appears fit to be placed back into its final operational cycle. Service includes the replacement of those items that must be replaced at service intervals and the verification that the device appears to be in good mechanical and electrical working condition by an ACR authorized service technician.

NOTICES

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